Changes to the draft Assessment Endpoint Table

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Receptor of Concern	Assessment Endpoint	Measures of Effect and Exposure	Changes to the table identified by the EPA and partners	Justification for the changes	Data needs (numbers correlate to the Data Needs Table)
Benthic					
The benthic community	Survival, growth and reproduction	Sediment toxicity testing to assess effects (direct toxicity and/or a predictive approach will be evaluated).	For Measures of E&E: (1) use the most conservative tissue-based TRVs in literature when evaluating measures of effect and exposure for the benthic community (e.g., clams, multiplate organisms, *Lumbriculus),* (2) add assessment of risk from groundwater discharge areas, using existing bioassay tests and either collecting tissue from groundwater discharge areas or doing in-situ testing and comparing results to Ambient Water Quality Criteria.	(1) The two tests being run (10 and 28 day tests) do not represent bioaccumulation. (2) Need a method to assess risk to benthic community from groundwater discharge.	1, 2, 4, 5
Shellfish (bivalves)	Survival, growth and reproduction	Tissue-based TRVs (provided sufficient clam tissue can be obtained) and benthic bioassay toxicity testing. For TBT, derive a site specific biota-sediment accumulation factor or use screening value based on sediment concentrations[1].	In the LWG's "Where addressed?" column, change to "Following tissue collection *and bioaccumulation studies* in Fall 2005"		1, 4, 5
Crayfish	Survival, growth and reproduction	Tissue based TRV approach.			1, 4
Fish					
Invertivore					
Juvenile Chinook Salmon[2]	Survival and growth	A combination of dietary TRV and tissue based TRV approach. For metabolized COPCs, determine potential exposure through diet, tissue, and/or biomarker analysis and assess potential effects on survival and growth. Compare water concentrations to AWQC criteria and literature-based values for protection of early life stages of salmonids.	For Measures of E&E: (1) consider TRVs that include reproductive effects (as a surrogate for growth), (2) need to make sure that the LWG is using peamouth as a surrogate to assess risk to juvenile salmon, (3) TRVs need to be included that incorporate other exposure and effect measures such as behavior and immunosuppression (provided these measures can be reasonably or quantitatively linked to survival, growth, or reproduction). For Assessment Endpoints, an additional endpoint is needed to represent protection of the benthic community to provide habitat for juveniles, in addition to protecting Chinook as an endpoint.		7
Adult Chinook Salmon[2]	Survival, growth and reproduction		For	Justification for adding this adult Chinook assessment endpoint is (1) it represents a unique exposure-receptor pathway, and (2) it is tied directly to salmon survival and reproduction.	
Peamouth	Survival, growth and reproduction	A combination of dietary and tissue based TRV approach. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages.	Reexamine peamouth and juvenile Chinook diets to determine how similar they are, and decide whether peamouth is an adequate representative of juvenile Chinook.		7, 8

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Sculpin[2]	Survival, growth and reproduction	A combination of dietary and tissue based TRV approach. For metabolized COIs, determine potential exposure through diet and/or biomarker analysis and assess potential effects on survival, growth and reproduction. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages.			4, 6, 7, 8, 10
Omnivore/Herbivore					
Carp (Surrogate Fish Tissue)[3,4]	Survival, growth and reproduction	Tissue-based TRV approach for dioxin-likecontaminants using literature values and incorporating toxic equivalent (TEQs) based on the World Health Organization toxic equivalent factors (TEFs). Risk from other compounds assessed in uncertainty analysis.			
Largescale Sucker[2,3,5]	Survival, growth and reproduction	A combination of dietary and tissue based TRV approaches. For metabolized COIs, determine potential exposure through diet, and/or biomarker analysis and assess potential effects on survival, growth, and reproduction. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages. Incorporate sediment ingestion as part of the dietary TRV. Note prevalence of external lesions or tumors.			7, 8, 9, 11
White Sturgeon	Survival, growth and reproduction	A combination of dietary and tissue based TRV approaches. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages. Modeling and/or additional data collection will be required if current data is inadequete to assess exposure and effects. [7]	Note: Unless LWG wants to do studies to determine sturgeon presence and residence time in ISA, LWG must assume 100% site fidelity for all sturgeon assessment endpoints to determine predictive risk in the screening level risk assessment.	(1) Sturgeon are more sensitive than other species. (2) The sturgeon's long lifetime is not represented; we need to learn more about this.	7, 8, 9, 11, 12, 13
Smallmouth Bass	Survival, growth and reproduction	A combination of dietary and tissue based TRV approaches. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages.		We need to understand variability of tissue concentrations in individual fish in the ISA; important for the Food Web Model and for understanding what populations are exposed to (data may be helpful for running a localized Food Web Model in some areas).	7, 8, 9
Piscivores					
Northern Pikeminnow	Survival, growth and reproduction	A combination of dietary and tissue based TRV approaches. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages.			7, 8, 9, 11
Detritivores					
Pacific Lamprey Amocoetes	Survival and growth	Tissue residue concentrations compared to relevant TRV or surrogate. In absence of tissue data, modeling to determine dietary and tissue concentrations. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages.			Direction on assessing riskto Lamprey and data needs coming soon
Wildlife					

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Bald Eagle	Survival, growth and reproduction	Dietary-based approach incorporating food chain transfer of contaminants from appropriate fish species (assuming all exposure comes from prey fish). Assess dioxin-like contaminants using a TEQ approach based on appropriate surrogate fish tissue data. Use TRVs based on the most sensitive life stages, which include egg or embryo-based TRVs for DDT and metabolites, PCBs, and dioxin-like compounds. Egg concentrations will be determined by egg analysis or by food chain modeling.	Note: Bald eagle can be represented by osprey, assuming individual level protection and 100% site use (no migration factor).	Need to estimate contaminant concentrations in Bald eagle eggs to validate the Food Web Model and assess risk to eagles.	14
Hooded Merganser	Survival, growth and reproduction	Dietary based TRV approach. Dietary based analysis using sculpin and/or invertebrate tissue data to represent feeding guild. In the absence of appropriate fish and invertebrate tissue concentrations, modeled concentrations will be used. For dioxin like contaminants (carp or appropriate prey species), use a TEQ-based approach to assess reproductive effects.	Note: In Measures of E&E, the LWG needs to do two ingestion scenarios - 100% invertebrates and 100% fish - for a conservative scenario (make sure it's not split 50% - 50%).		1, 2, 4, 5, 6
Osprey	Survival, growth and reproduction	Dietary-based approach incorporating food chain transfer of contaminants from appropriate fish species (primarily pikeminnow and sucker). Assess dioxinlike contaminants using a TEQ approach based on appropriate surrogate fish tissue data. Use TRVs based on the most sensitive life stages, which include egg or embryo-based TRVs for DDT and metabolites, PCBs, and dioxin-like compounds. Egg concentrations will be determined by egg analysis or by food chain modeling.		Need to understand contaminant concentrations in osprey eggs to validate the Food Web Model and assess risk to osprey.	14
Spotted Sandpiper[3]	Survival, growth and reproduction	Dietary based TRV approach. Sediment concentrations determined from site specific evaluation. In the absence of appropriate invertebrate tissue concentrations, use modeled invertebrate tissue concentrations.			1, 2, 4, 5, 6, 15
Mink [6]	Survival, growth and reproduction	Dietary based TRV approach, considering both relevant fish species concentrations and invertebrate (crayfish) components of the diet. For dioxin-like contaminants (carp or appropriate prey species), use a TEQ-based approach to assess reproductive effects.	(1) Need to ensure that the LWG uses two ranges of diet - one for mink and one for otter. (2) Need to analyze the larger mussels for diet, and could concentrate sampling/analysis on larger habitat areas for mink, otter, mussels (i.e., Rhone Poulenc).	Otter has a different diet than mink (feeds on carp).	1, 2, 4, 5, 6, 15
Amphibians	Survival, growth and reproduction	Water concentrations compared to literature-based values or AWQC to protect sensitive life stage.	Note: Use amphibian and bird endpoints to provide protection for reptiles.		3, 15
Plants					
Aquatic Plants	Survival, growth and reproduction	Comparison of emergent aquatic plant exposure based on concentrations of chemicals in sediment and relevant toxicological data.			3, 15

Footnotes:

[1] For TBT, suggested screening value of 6,000 ng/g OC (based on 2 % OC), which represents a dry wt concencentration of 120 ng/g.

[2] Considered representative of fish exposure to PAHs. Analysis should include an analysis of whether these compounds are found in the diet of the fish receptors, as well as if found in tissue analysis.

[3] Considered representative of sediment ingestion.

[4] Carp is not a receptor of concern for the ecological risk assessment.; whole-body fish tissue (I.e., carp) was analyzed for dioxin-like chemicals, including PCB congener analysis, and is a surrogate for other fish species for these chemicals.

[5] Represents a resident broadcast spawner. Therefore, exposure to sensitive early life stages and eggs will be assessed to all contaminants, including PAHs and dioxin like compounds.

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[6]Mink was selected to also represent river otter. Therefore, the dietary requirements of the river otter, which include a fish diet, must be assessed.

[7]Possible approaches for sturgeon will be developed through the ecological risk assessment TM process and the approach for the site will be selected following discussions between the LWG, EPA and its partners.